eyeheight

CC-2

SD-HD-3G Colour Corrector

user manual

User Manual Versions

Versions	Changes	Date	SW Vers
1.00-1.00	Provisional Versions	27/05/09	SD V1.20 HD V1.20
1.1	Updated for 3G line standards	22/5/2012	

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1 System Overview

This manual describes the function of the CC-2. The CC-2 is a geNETics processing card which fits into a single slot of the eyeheight etherBox (FB-9E).

This unit come in three different styles:

1. The CC-2M, Multi-definition unit, capable of SD and HD operation.
2. The CC-2S, Standard definition unit, capable of SD operation only.
3. The CC-2G, Multi-rate unit for SD-HD and high frame rate 1080P/50-60
4. There is also a CC-2Xc version of this which is specifically designed to work with a FP-9c colour panel. This gives the user a more intuitive colour corrector operation. You cannot mix the “c” versions with the non “c” versions or any other Eyeheight genetics product.

Within this manual it can be assumed that references to the CC-2 refer to all styles of processing card. When there are differences it will be pointed out specifically. This manual must be used in conjunction with the etherbox manual which contains much of the generic information common to all eyeheight geNETics products.

1.1 The CC-2 Product

The CC-2 is a colour corrector. The system will accept either 270Mbit SMPTE 259 (SDI, CC-2S, CC-2M and CC-2G) or 1485Mbit SMPTE 292 (HD-SDI, CC-2M and CC-2G) or SMPTE 424 2970Mbit (CC-2G only) signals. This system enables up to 6 channels of colour correction in a 1RU chassis. This CC-2 is designed specifically to work in conjunction with the etherBox chassis (FB-9E).

The main features are –

- One dual Colour Corrected output and one monitoring output.
- Full 10 bit processing.
- Simple individual control of RGB gain, lift and master gamma.
- Overall luma, chroma gain and black level adjustment.
- Overall hue correction.
- monitoring output can be used to show a vertical or horizontal wipe of colour corrected against original.
- Gamut legalization as standard, EBU R103-2000 capable.
- Adjustable legalisation levels.
- Highly effective luma overshoot and undershoot suppression.
- EDH/CRC re-insertion.
- 6 user memories.

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- FULLY software and firmware updatable using Flash technology.
- mechanical relay bypass option available.
- On-Board simple text based RS232 automation protocol.
- Web Based Control Panel

1.2 Associated Equipment for the CC-2

The CC-2 processing card requires the following in order to set up and operate the unit.

1. An etherbox chassis (FB-9E). Up to six CC-2 units and be installed in one chassis.
2. A Flexipanel control surface such as an FP-9 or an FP-10.

Figure 1 - Front view of etherbox (FB-9E) fitted with FF-9 blank panel

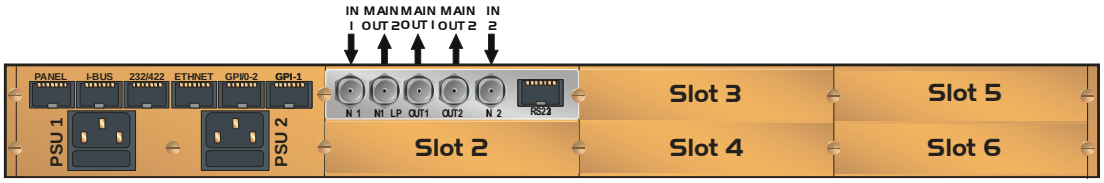

Figure 2 Rear view of etherbox with a single CC-2 installed.

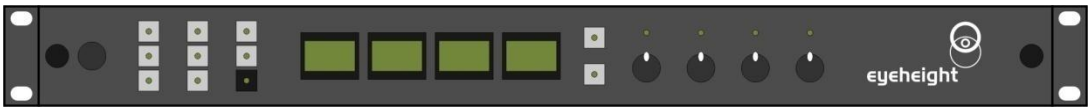

Figure 3 FP-9 Flexipanel can be fitted on the FB-9E or remotely using and RR-9 kit.

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2 Installation

This unit requires HDI or SDI digital video connections to the BNC connectors. Optionally RS232 may also be connected normally using CAT5e cable. The user should refer to the etherbox user manual for installation of the CC-2 into a chassis and connection of flexipanels. This will also describe the process of acquiring a processing card (in this case the CC-2) by the Flexipanel which is necessary to access the menu structure within the CC-2.

2.1 Connections on the CC-2 product

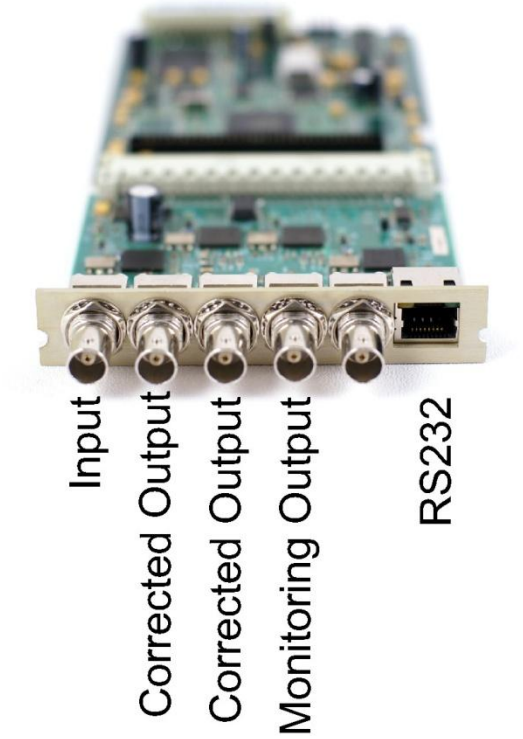

Figure 4 CC-2 connections

The main video connections to the CC-2 are shown above. The Corrected Output has two identical output connections; the Monitoring Output channel has one output. The RS232 connection pin-outs are shown in the technical appendix at the end of this manual.

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3 Menu Control of the CC-2

All GeNETics products are controlled using a generic menu system. This generic menu system is operated from a generic panel (Flexipanel FP-9 or FP-10). An FP-9 is shown below (An FP-10 has the same controls in a different layout style). For information about acquiring processor cards for control on a Flexipanel see the etherbox manual section 4.

3.1 Flexipanel controls

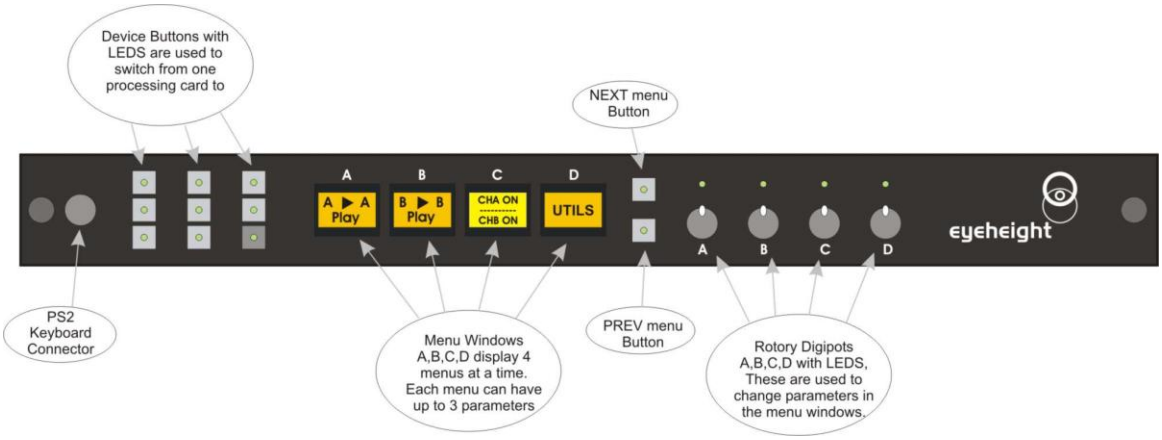
Device Buttons with LEDS are used to switch from one processing card to
NEXT menu Button
A
B
C
D
A ▶ A Play
B ▶ B Play
CHA ON
CHB ON
UTILS
eyeheight
PS2 Keyboard Connector
Menu Windows A,B,C,D display 4 menus at a time. Each menu can have up to 3 parameters
PREV menu Button
Rotory Digipots A,B,C,D with LEDS, These are used to change parameters in the menu windows.

Figure 5 Flexipanel (FP-9) controls.

3.1.1 Device Buttons

There are 8 grey device buttons. These switch between the currently selected processing cards installed in the etherbox. It is also possible to select cards in another chassis if the I-Bus is connected to the other chassis.

3.1.2 Menu Navigation

There are two ways to navigate from menu to menu.

1. Using the NEXT and PREV buttons. These are for “Flat” menu structures. The NEXT and PREV LEDS will flash while further menus are available.
2. Using a GOTO ANOTHER MENU LCD button (as below coloured orange). This is more common and will take you straight to a relevant set of menus. Examples are the Play and UTILS menu’s shown on Figure 8.

Figure 6 Types of menus showing their characteristic colours

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3.1.3 Parameter adjustment of a green menu

A green menu is one in which there is only one adjustable parameter. There are two ways to adjust the parameter in a green menu.

1. Press the green LCD button. This will increment the value in that window. This is most frequently done when the menu parameter is Textural for example switching a parameter between ON and OFF. In this case a button press is most natural.
2. Use the Rotary digipot (A, B, C or D) to adjust the parameter in the respective LCD window (A, B, C or D). The direction and speed of rotation enable numeric values to be set easily.

3.1.4 Parameter adjustment of a red menu

A red menu is one in which there is two or three adjustable parameters. In this case it is necessary to first select the menu by pressing the red button. When the red button is pressed it will turn green and either two or three of the rotary digipot LEDS will flash indicating that the respective rotary digipot will operate the respective parameter.

3.1.5 Information display

A Yellow menu (Which on most panels does look a light orange!) is one in which only information is displayed. An example of this is the software version display.

3.2 Memories

3.2.1 Power on memory

On power up, this product will follow the power on memory settings set as on menu 96.

3.2.2 User Memories

The user memories are a generic feature of all eyeheight geNETics products. Six of these are included in the CC-2. Parameters as shown in the RED menu numbers are saved.

3.2.3 Naming User Memories

The user memories can be named with up to 6 characters. To do this plug in a PS-2 Keyboard into a Flexipanel and select the appropriate processor card with a device button. (See Figure 6 for connector location). To name memory 1, “TXroom”

1. Hit F9 function key. The LCD displays will change to text entry mode
2. Type “M01:TXroom” and then press enter.
3. You may get a “not acknowledged” message, this does not matter.

Other memories can be named in the same way but changing the 01 to another memory number.

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3.3 Tamper Locking the CC-2

The user can lock specific menus or all the menus on the CC-2 so that it cannot be adjusted with a manual control panel. This does not effect automation.

To do this plug in a PS-2 Keyboard into a Flexipanel and select the appropriate processor card with a device button. (See Figure 6 for connector location). To lock only menu 5 -

1. Hit F9 function key. The LCD displays will change to text entry mode
2. Type “L05:” and then press enter.

A padlock symbol will appear on the menu and it cannot be adjusted. To unlock menu 5, type “A05:” as step 2 above. Other menus are done in the same way

To lock the whole product type “L:” as step 2 above and to unlock the whole product type “A:” as step 2 above.

3.4 Web Control of the CC-2

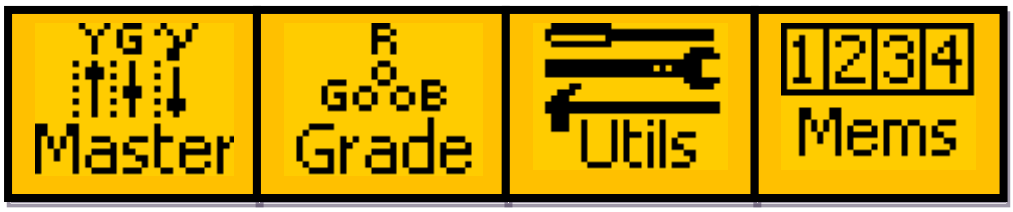
If the CC-2 is installed in the etherbox it is possible to control the CC-2 primary functions from a web based java applet. Please refer to the etherbox manual for instructions on how to set up the system to do this.

3.5 The CC-2 Menu Set

The following set of menus defines the operational controls of the CC-2.

Note: Only parameters with RED menu numbers are stored in the memories and the Power-ON memory.

Menus 00-03 Top Level Menus



Menu Num.	Heading	Function
0	Master	Pressing this button will select the MASTER control menus. (Go To Menu 4).

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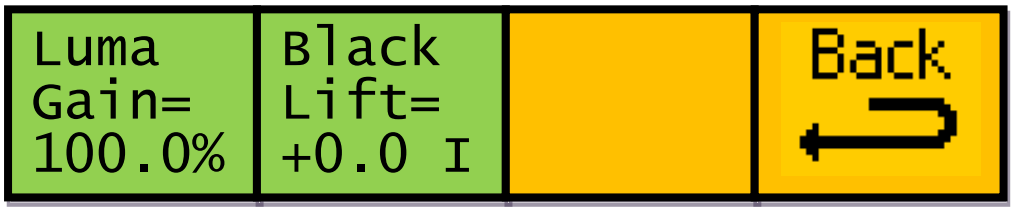
1	Grade	Pressing this button will select the Individual GRADE control menus. (Go To Menu 16).
2	Utils	Pressing this button will select the onboard utilities, such as the legaliser. (Go To Menu 28).
3	Memory	Pressing this button will select the memory control menus. (Go To Menu 52).

Menus 04-07 Master controls

Menu Num.	Heading	Function
4	LUMA	Pressing this button will select the luma control menus. (Go To Menu 8).
5	CHROMA	Pressing this button will select the chroma control menus. (Go To Menu 12).
6	GAMMA	Pressing this button will select the gamma value menus. (Go To Menu 80).
7	BACK	Pressing this button will take the user back to the main menu.

Menus 08-11 Luma control menu



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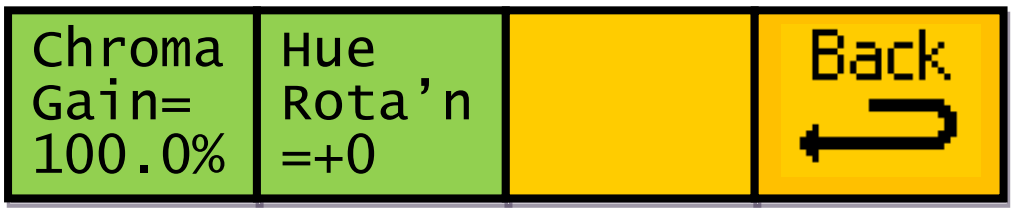
Menu Num.	Heading	Function
8	Luma Gain (0 → 199.7%)	This option sets the Luma gain.
9	Black Lift (-29 → 28.9)	This option sets the black lift
10		none
11	Back	Pressing this button will take the user back to the master control menu

Menus 12-15 Chroma control menu



Menu Num.	Heading	Function
12	Chroma Gain (0 to 199.7%)	This option sets the Chroma gain.
13	Hue Rota'n (-180 to +180)	This option sets the Hue rotation.
14		None
15	Back	Pressing this button will take the user back to the master control menu

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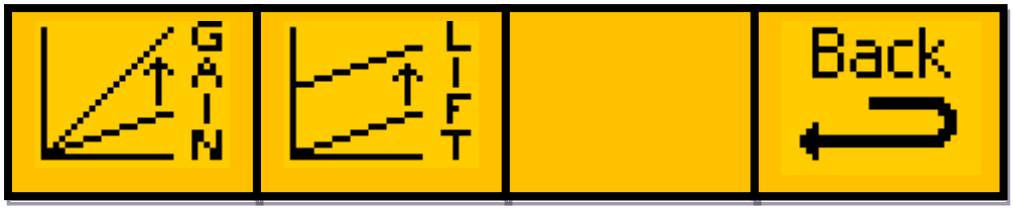
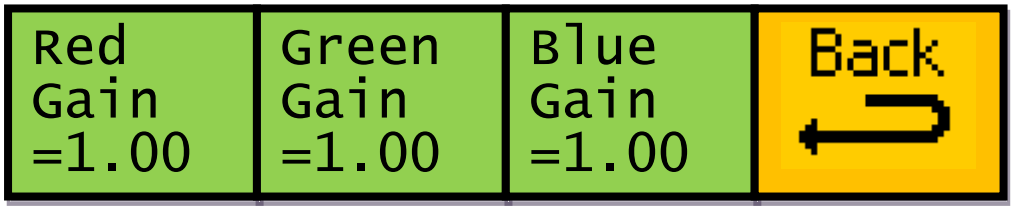
Menus 16-19 Grade control menu



Menu Num.	Heading	Function
16	Gain menu	Pressing this button will select the grade gain control menu. (Go To Menu 20).
17	Lift menu	Pressing this button will select the grade lift control menu. (Go To Menu 24).
18		None
19	Back	Pressing this button will take the user back to the main menu

Menus 20-23 Grade gain control menu



Menu Num.	Heading	Function
20	Red Gain 0 to 16	This option sets the Red gain.
21	Green Gain 0 to 16	This option sets the Green gain.
22	Blue Gain 0 to 16	This option sets the Blue gain.
23	Back	Pressing this button will take the user back to the main menu

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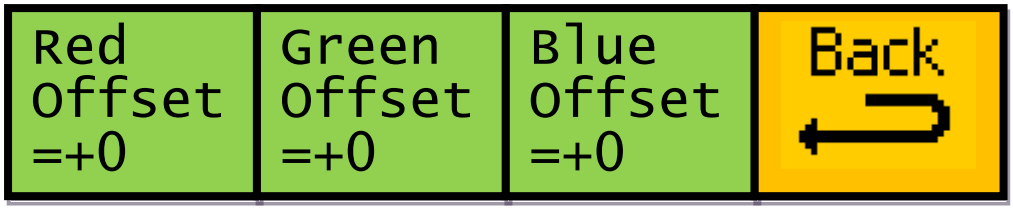
Menus 24-27 Grade Offset control menu



Menu Num.	Heading	Function
24	Red Offset -512 to +511	This option sets the Red offset.
25	Green Offset -512 to +511	This option sets the Green offset.
26	Blue Offset -512 to +511	This option sets the Blue offset.
27	Back	Pressing this button will take the user back to the grade control menu

Menus 28-31 Utils control menu

Menu Num.	Heading	Function
28	Legalr menu	Pressing this button will select the legaliser control menu. (Go To Menu 32).
29	Monitor menu	Pressing this button will select the Monitor Control menu. (Go To Menu 88).
30	Gamma menu	Pressing this will select the Gamma Control menu. (Go To Menu 84).
31	Back	Pressing this button will take the user

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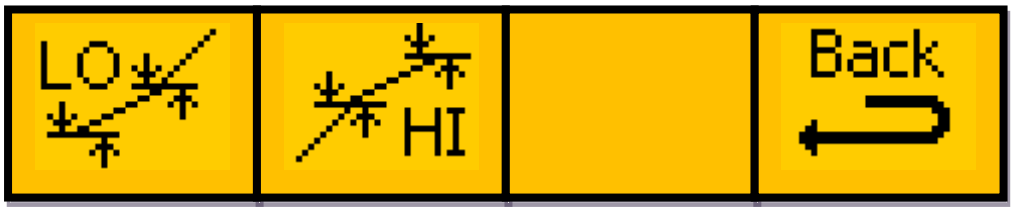
		back to the main menu

Menus 32-35 Legaliser control menu

Menu Num.	Heading	Function
32	Legalr	Pressing this will turn the legaliser on or off.
33	CLIP menu	Pressing this button will select the legaliser clip control menu. (Go To Menu 36).
34	RING menu	Pressing this button will select the legaliser ring control menu. (Go To Menu 48).
35	Back	Pressing this button will take the user back to the Utils menu

Menus 36-39 Legaliser Clip control menu



Menu Num.	Heading	Function
36	LOW Menu	This option sets the low clip menus. (Go To Menu 40).
37	HIGH menu	This option sets the high clip menus. (Go To Menu 44).
38		None
39	Back	Pressing this button will take the user back to the Legaliser control menu

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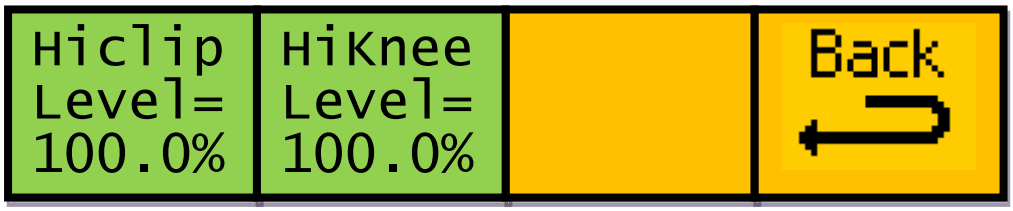
Menus 40-43 Low clip control menu

Menu Num.	Heading	Function
40	LoClip Level - 7.1 to +50.8%	This option sets the level of the low clip point.
41	LoKnee Level - 7.1 to +50.8%	This option sets the level of the low knee point.
42		None
43	Back	Pressing this button will take the user back to the Legaliser clip control menu

Menus 44-47 High clip control menu



Menu Num.	Heading	Function
44	HiClip Level 50.9 to 109%	This option sets the level of the high clip point.
45	HiKnee Level 50.9 to 109%	This option sets the level of the high knee point.
46		None
47	Back	Pressing this button will take the user back to the Legaliser clip control menu

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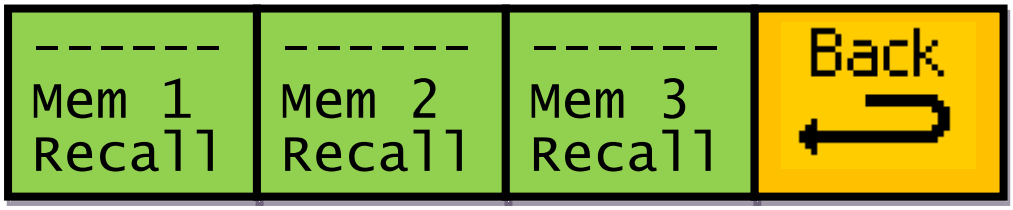
Menus 48-51 Ring suppression control menu

Menu Num.	Heading	Function
44	Ring Supr'n	Pressing this will select the mode of the ring suppression, off, automatic or manual.
45	LoRing Threshold –6.8 to +51.2%	This option sets the level of the low ring threshold point.
46	HiRing Threshold 50.9% to 109%	This option sets the level of the high ring threshold point.
47	Back	Pressing this button will take the user back to the Legaliser clip control menu

Menus 52-71 Memories



Menu Num.	Heading	Function
52	MEM1	Pressing this will recall Memory number 1. User Names can be programmed in to the memories using a keyboard. See "geNETics User guide", section "Giving product Memories names"
53	MEM2	Pressing this will recall Memory number 2.
54	MEM3	Pressing this will recall Memory number

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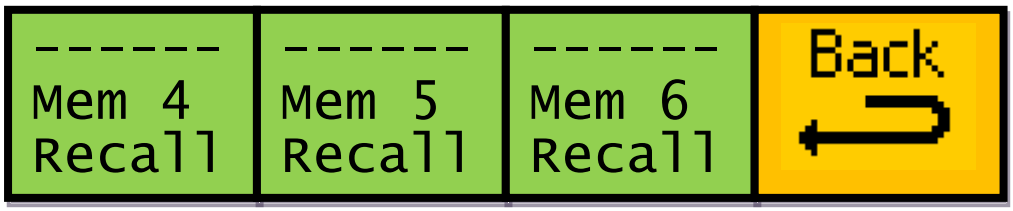
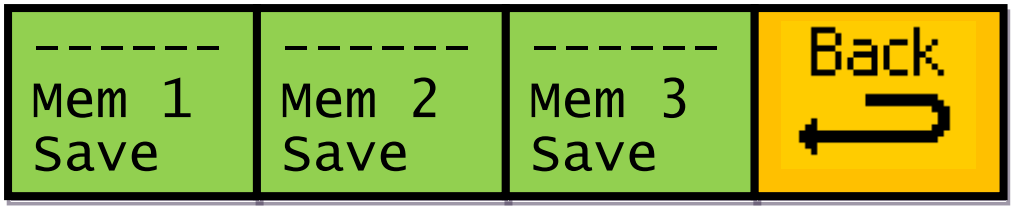
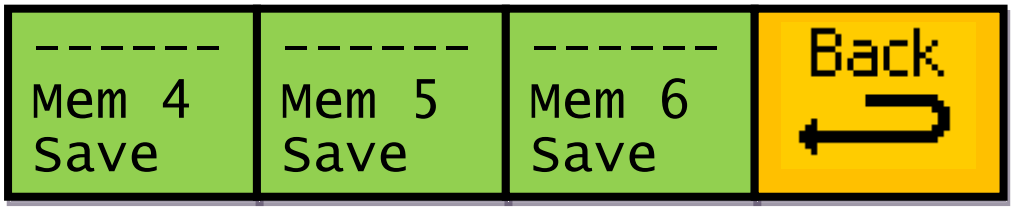
		3.
55	BACK	Go To the Utility Menus



Menu Num.	Heading	Function
56	MEM4	Pressing this will recall Memory number 4.
57	MEM5	Pressing this will recall Memory number 5.
58	MEM6	Pressing this will recall Memory number 6.
59	BACK	Go To the Utility Menus



Menu Num.	Heading	Function
60	SAVE MEM1	Pressing this will Save Memory number 1.
61	SAVE MEM2	Pressing this will Save Memory number 2.
62	SAVE MEM3	Pressing this will Save Memory number 3.
63	BACK	Go To the Utility Menus



Menu Num.	Heading	Function

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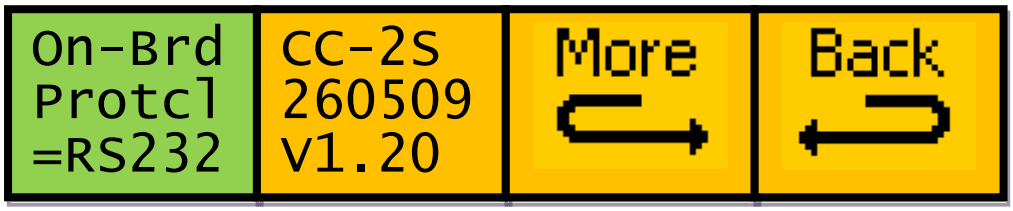
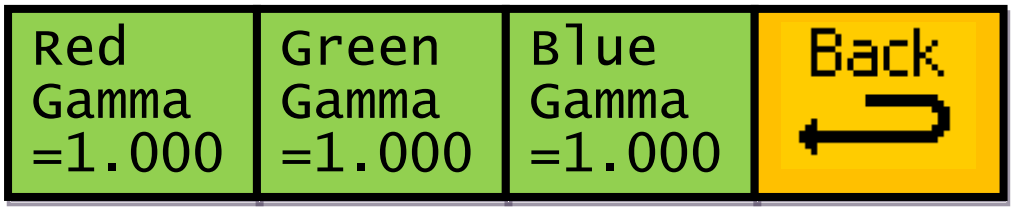
64	SAVE MEM4	Pressing this will Save Memory number 4.
65	SAVE MEM5	Pressing this will Save Memory number 5.
66	SAVE MEM6	Pressing this will Save Memory number 6.
67	BACK	Go To the Utility Menus



Menu Num.	Heading	Function
68	On-Board Protocol	Two options are: OFF RS232
69		Software Version
70	More	This takes you to Resets and Software upgrade. (Go To Menu 92).
71	BACK	Pressing this button will take the user back to the main menu.

Menus 80-83 Gamma Value menu



Menu Num.	Automation	Function
80	0x28→0x1fff	This option sets the Red Gamma. The action depends on menu#85.
81	0x28→0x1fff	This option sets the Green Gamma. The action depends on menu#85.
82	0x28→0x1fff	This option sets the Blue Gamma. The action depends on menu#85.

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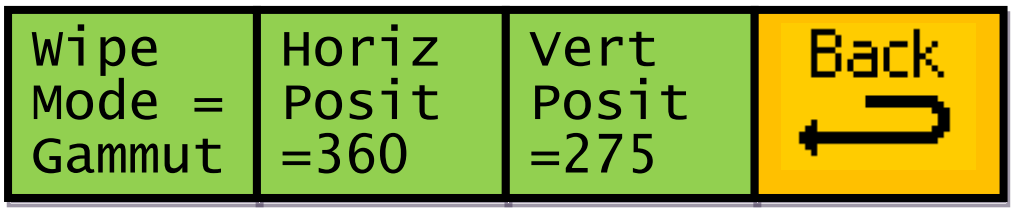
83	N/A	Pressing this button will take the user back to the main menu

Menus 84-87 Gamma Control menu

Menu Num.	Heading	Function
84	Gamma Range	Pressing this will select whether the gamma function acts over the entire range (0-1023) or has two fixed points (64,940). The latter is the normal mode of operation.
85	Gamma mode	In Ganged mode the RGB Gamma controls in menus#80→82 act together (track) as a master gamma. In RGBsep mode, the RG and B gamma can be individually adjusted.
86		
87	Back	Pressing this button will take the user back to the Utility Menus

Menus 88-91 Monitor Control menu



Menu Num.	Heading	Function
88	Wipe Mode	Legaliser indicate out or wiped output consists of nine options which are: Gammut Wipe H Wipe V WipeHV

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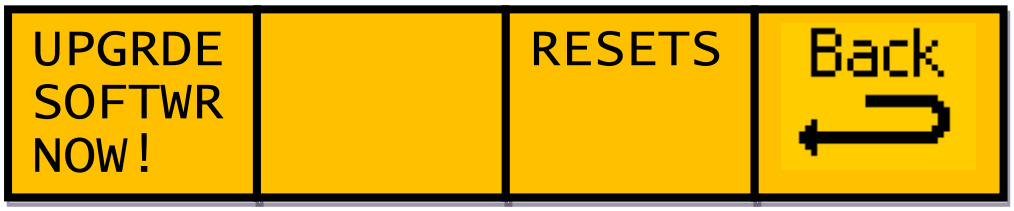
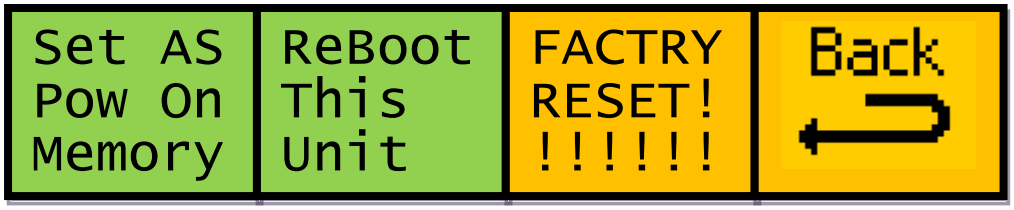
		HV Inv Test H Test V TestHV T HVIn (Test HV Invert)
89	SD 000→720 HD 000→1920	Horizontal Position of wipe
90	SD 000→576 HD 000→1080	Vertical Position of wipe
91	Back	Pressing this button will take the user back to the Utility Menus

Menus 92-111 Resets and Software Upgrade



Menu Num.	Heading	Function
92	Upgrade Software	Pressing this will take you to the Software Upgrade last chance menu. (Go To Menu 104).
93		
94	Resets	Pressing this will take you to the Reset Options. (Go To Menu 96).
95	BACK	Pressing this button will take the user back to the main menu.



Menu Num.	Heading	Function

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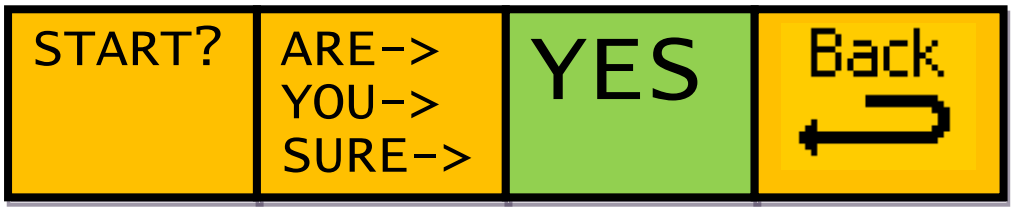
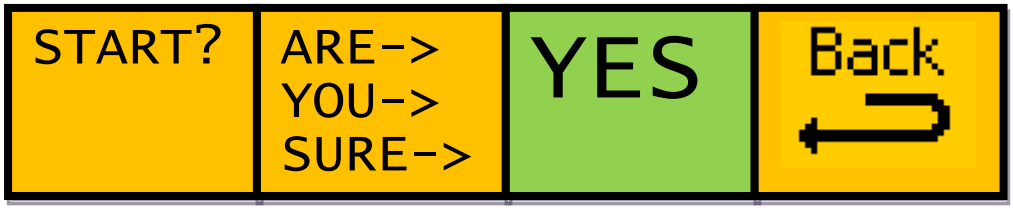
96	Set as Power on Memory	Pressing this will set the current settings as the default settings when the unit is powered up. This only applies to menus whose menu number is in RED.
97	Reboot this unit	This applies a warm restart to the unit. It is the software equivalent of recycling the power.
98	Factory Reset	Pressing this will take you to the Factory Reset Last Chance menu. (Go To Menu 100).
99	BACK	Go To the Resets and Software Upgrade Menus. (Go To Menu 92).



Menu Num.	Heading	Function
100	----	----
101	----	----
102	YES, I want to do a factory reset!	This will Start a factory Reset of the unit. This will Wipe ALL Logos and Settings that may have been previously set-up. Only do this if you are setting up from scratch, or there is a problem with your unit.
103	BACK	Go To the Resets and Software Upgrade Menus. (Go To Menu 92).



Menu Num.	Heading	Function
104	----	----
105	----	----
106	YES, I want to start a	This will Start a software upgrade of the unit. You will need to follow the instructions in the etherbox (FB-9E)

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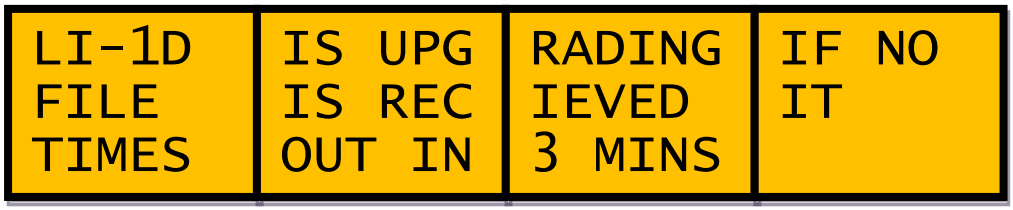
	software upgrade	manual to correctly perform this procedure. This will Wipe ALL settings back to default levels. The unit MUST be installed in an FB-9E to perform an upgrade.
107	BACK	Go To the Resets and Software Upgrade Menus. (Go To Menu 92).



Menu Num.	Heading	Function
108	----	This is a system message. If you accidentally press “Software Upgrade” then this message appears. If you have done this accidentally, simply WAIT 3 minutes and the system will return back to normal.
109	----	----
110	----	----
111	----	----

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4 Technical Appendix

4.1 GPI/Tally/RS232 technical information

The Processor card has an RJ-45 connector with RS232 connections as shown below:

1	Not Used	White/Orange
2	Not Used	Orange
3	Not Used	White/Green
4	GND	Blue
5	RS232 TX	White/Blue
6	RS232 RX	Green
7	Not Used	White/Brown
8	Not Used)	Brown

Table 1 RS232 pin-out on RJ-45.

4.1.1 RS232 Interface

This loosely follows the pin convention of EIA-561 which is a standard for RS232 on an RJ45 cable. Only TX, RX and Signal ground (pin 4) are implemented. For the CC-2 the following RS232 parameters apply:

- 115Kbaud
- 8 Bits, no parity
- 1 Stop bit.

4.2 On-Board automation protocol

4.2.1 Implementation on RS232

A simple text based protocol has been implemented on the RS232 interface.

Command Description	Sent byte sequence	Good Response	Bad Response	Low Lim (Hex)	High Lim (Hex)	Default Value (Hex)	Display Scaler(dec)
Set red gamma **(SrG)**	06 **53 72 47** HH LL CS	02 06 CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Read red gamma **(RrG)**	04 **52 72 47** CS	06 **52 72 47** HH LL CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Set green gamma **(SgG)**	06 **53 67 47** HH LL CS	02 06 CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Read green gamma **(RgG)**	04 **52 67 47** CS	06 **52 67 47** HH LL CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Set blue gamma **(SbG)**	06 **53 62 47** HH LL CS	02 06 CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Read blue gamma **(RbG)**	04 **52 62 47** CS	06 **52 62 47** HH LL CS	02 15 CS	0x0028	0x1FFF	0x0400	8/8192
Set master gamma **(SmG)**	06 **53 6D 47** HH LL CS	02 06 CS	02 15 CS	0x0040	0x1FFF	0x0400	8/8192
Read master gamma **(RmG)**	04 **52 6D 47** CS	06 **52 6D 47** HH LL CS	02 15 CS	0x0040	0x1FFF	0x0400	8/8192

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Set red gain (SrL)	06 53 72 4C HH LL CS	02 06 CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Read red gain (RrL)	04 52 72 4C CS	06 52 72 4C HH LL CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Set green gain (SgL)	06 53 67 4C HH LL CS	02 06 CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Read green gain (RgL)	04 52 67 4C CS	06 52 67 4C HH LL CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Set blue gain (SbL)	06 53 62 4C HH LL CS	02 06 CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Read blue gain (RbL)	04 52 62 4C CS	06 52 62 4C HH LL CS	02 15 CS	0x0000	0x1000	0x0100	0.390625
Set master gain (SmL)	06 53 6D 4C HH LL CS	02 06 CS	02 15 CS	0x0000	0x01FF	0x0100	0.390625
Read master gain (RmL)	04 52 6D 4C CS	06 52 6D 4C HH LL CS	02 15 CS	0x0000	0x01FF	0x0100	0.390625
Set red lift (SrB)	06 53 72 42 HH LL CS	02 06 CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Read red lift (RrB)	04 52 72 42 CS	06 52 72 42 HH LL CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Set green lift (SgB)	06 53 67 42 HH LL CS	02 06 CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Read green lift (RgB)	04 52 67 42 CS	06 52 67 42 HH LL CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Set blue lift (SbB)	06 53 62 42 HH LL CS	02 06 CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Read blue lift (RbB)	04 52 62 42 CS	06 52 62 42 HH LL CS	02 15 CS	0xFE00	0x01FF	0x0000	0.1142
Set master lift (SmB)	06 53 6D 42 HH LL CS	02 06 CS	02 15 CS	0xFF00	0x00FF	0x0000	0.390625
Read master lift (RmB)	04 52 6D 42 CS	06 52 6D 42 HH LL CS	02 15 CS	0xFF00	0x00FF	0x0000	0.390625
Set chroma gain (ScG)	06 53 63 47 HH LL CS	02 06 CS	02 15 CS	0x0000	0x01FF	0x0100	0.390625
Read chroma gain (RcG)	04 52 63 47 CS	06 52 63 47 HH LL CS	02 15 CS	0x0000	0x01FF	0x0100	0.390625
Set hue rotation (ShR)	06 53 68 52 HH LL CS	02 06 CS	02 15 CS	0xFE00	0x01FF	0x0000	0.35217285
Read hue rotation (RhR)	04 52 68 52 CS	06 52 68 52 HH LL CS	02 15 CS	0xFE00	0x01FF	0x0000	0.35217285
Set legaliser status (SlS)	06 53 6C 53 HH LL CS	02 06 CS	02 15 CS	0x0000	0x0001	0x0001	N/A
Read legaliser status (RlS)	04 52 6C 53 CS	06 52 6C 53 HH LL CS	02 15 CS	0x0000	0x0001	0x0001	N/A
Return software version (Ver)	04 56 65 72 CS	CC < CC Ascii bytes-1> CS	02 15 CS				
Check for existance	02 05 CS	02 06 CS	No Response				

4.3 geNETics Automation Protocol Parameter table.

This is the automatically extracted parameters for the CC-2. This is used for the generic geNETics automation protocol. See etherbox manual for a full description of its usage.

4.4 Technical Specification

When in SDI mode:

SDI Inputs (270 Mbps, 800mV p-p±10% into 75Ω)	1 Input to SMPTE 259M Input
SDI Outputs (270 Mbps, 800mV p-p±10% into 75Ω)	3 Outputs to SMPTE 259M Out1, Out 2, Monitor Out
SDI cable equalisation	At least 200m of PSF 1/3 Return loss better than 18dB, 5 MHz – 270 Mhz

When in HD-SDI mode:

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HD-SDI Inputs (1.845 Gbps, 800mV p-p±10% into 75Ω)	1 Input to SMPTE 292M Input
HD-SDI Outputs (1.485 Gbps, 800mV p-p±10% into 75Ω)	3 Outputs to SMPTE 292M Out1, Out 2, Monitor Out
HD-SDI cable equalisation	At least 120m of Belden 1694A

When in 3G-SDI mode:

HD-SDI Inputs (2.970Gbps, 800mV p-p±10% into 75Ω)	1 Input to SMPTE 292M Input
HD-SDI Outputs (2.970 Gbps, 800mV p-p±10% into 75Ω)	3 Outputs to SMPTE 292M Out1, Out 2, Monitor Out
HD-SDI cable equalisation	At least 80m of Belden 1694A

General:

Ancillary Data	Passes all ancillary data in vertical and horizontal blanking except for CRC recalculation.
Control Surfaces	Option of local or remote **FP-9** control panel.
Chassis	**FB-9E etherBox** 1U enclosure
Supported Formats	720x576/50i 720x487/60i 720x507/60i 1280x720/23.98p 1280x720/24p 1280x720/25p 1280x720/29.97p 1280x720/30p 1280x720/50p 1280x720/59.94p 1280x720/60p 1920x1080/23.98p 1920x1080/23.98psf 1920x1080/24p 1920x1080/24psf 1920x1080/25p 1920x1080/50i 1920x1080/29.97p 1920x1080/59.94i 1920x1080/30p 1920x1080/60i

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	1920x1080/50p 1920x1080/60p
Delay	<10us
Power Supply	100-240v AC. Less than 50W power consumption with 6 **CC-2M** units installed.
FB-9E Dimension	Width 442mm Height 44mm Depth 300mm
Weight	<3Kg
Temperature	<25°C ambient, <55°C internal
Humidity	Recommended 40 to 55% Limits 20 to 80%

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